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CLAIMS

1. A superconducting material of formula $MgB_xSi_yC_z$ where X is a number in the range between 0 to 2, Y is a number in the range between 0 to 1 and Z is a number in the range 0 to 1, and where the sum of X, Y and Z is greater than or equal to 2.
- 5 2. A superconducting material in accordance with claim 1, where X is in the range between 1 to 2, Y is in the range between 0.05 to 0.5 and Z is in the range 0.1 to 0.3.
- 10 3. A superconducting material in accordance with claim 1, where X is in the range of 1.2 to 1.8, Y is in the range of 0.1 to 0.3, and Z is in the range 0.1 to 0.3.
- 15 4. A superconductor incorporating the superconducting material of claim 1, claim 2 or claim 3.
5. A method of synthesising the superconducting material of claim 1 comprising the step of utilising starting materials Mg, B, Si and C.
- 20 6. A method in accordance with claim 5, wherein the starting materials are in powder form.
7. A method in accordance with claim 6, wherein the powders consist of nanoparticles.
- 25 8. A method of synthesising the superconducting material of claim 1 comprising the step of utilising starting materials Mg, B and SiC.
9. A method in accordance with claim 8, wherein the starting materials are in powder form.
- 30 10. A method in accordance with claim 9, wherein the powders consist of nanoparticles.
11. A method of synthesising a superconducting material in accordance with claim 1 comprising the step of utilising starting materials MgB_2 and SiC or Si and C.
- 35 12. A method in accordance with claim 11, wherein the starting materials are in powder form.

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13. A method in accordance with claim 12, wherein the powders consist of nanoparticles.
14. A method of producing a superconducting material, comprising the steps of adding silicon carbide to a superconducting material.
- 5 15. A method in accordance with claim 14, wherein the silicon carbide is added by way of substitution.
16. A method in accordance with claim 14, wherein the silicon carbide is added by way of addition.
- 10 17. A superconducting material including a silicon carbide codopant.
18. A superconducting material of the formula of formula $MgB_xTi_yC_z$ where X is a number in the range between 0 to 2, Y is a number in the range between 0 to 1 and Z is a number in the range 0 to 1, where the sum of X, Y and Z is greater than or equal to 2, and X is greater than 0.
- 15 19. A method of manufacturing a material capable of functioning as a superconductor, comprising the steps of,
 - mixing elemental magnesium and elemental boron with an amount of one or more of the group comprising silicon carbide and titanium carbide, and
 - heating the powders to sinter the powders into a material capable of functioning as a superconductor.
20. A method of manufacturing a material capable of operating as a superconductor, comprising the steps of,
 - mixing elemental magnesium and elemental boron with an amount of one or more of the group comprising elemental silicon, elemental carbon and elemental titanium, and
 - heating the mixture to sinter the mixture into a material capable of functioning as a superconductor.
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21. A method in accordance with claim 20, wherein the mixture is heated to a temperature in the range between 650° to 2000°.
22. A method in accordance with claim 20, wherein the 5 mixture is heated to a temperature in the range of 900-950°C.
23. A method in accordance with claim 20, wherein the elements are provided in a powder form.
24. A method in accordance with claim 23, wherein the 10 powders consist of nanoparticles.
25. A method in accordance with claim 20, wherein the powders are groove-rolled into a tube manufactured from a material of one or more of the group comprising iron (Fe), copper (Cu), nickel (Ni) and 15 stainless steel prior to heating the mixture.
26. A method in accordance with claim 20, comprising the further step of cooling the resultant material to the temperature of liquid nitrogen, to render the material capable of superconducting.